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C Ward Henson* (henson@math.uiuc.edu), Mathematics Department, University of Illinois, 1409 W Green Street, Urbana, IL 61801. *Uncountably categorical Banach space structures*. Preliminary report.

Model theory is applied to (unit balls of) Banach spaces (and structures based on them) using the $[0, 1]$ -valued continuous version of first order logic. A theory T of such structures is said to be κ -categorical if T has a unique model of density κ . Work of Ben Yaacov and Shelah-Usvyatsov shows that Morley's Theorem holds in this context: if T has a countable signature and is κ -categorical for some uncountable κ , then T is κ -categorical for all uncountable κ .

Known examples of uncountably categorical such structures are closely related to Hilbert space. After the speaker called attention to this phenomenon, Shelah and Usvyatsov investigated it and proved a remarkable result: if M is a nonseparable Banach space structure (with countable signature) whose theory is uncountably categorical, then M is prime over a Morley sequence that is an orthonormal Hilbert basis of length equal to the density of M .

Questions: (1) can a stronger such result be proved, in which the connection to Hilbert space structure is clearly expressed in the geometric language of functional analysis? (2) what examples of uncountably categorical Banach spaces are known (or conjectured) and what light can they shed on question (1)? (Received December 12, 2011)